PIER Energy-Related Environmental Research
Environmental Impacts of Energy Generation, Distribution and Use

Evaluating Diverter Effectiveness in Reducing Avian Collision with Distribution Lines at San Luis National Wildlife Refuge Complex

Contract #: 500-01-032
Contractor: Ventana Wildlife Society
Exploratory Grant Amount: $68,501.28
Match Funding: $44,000
Contractor Project Manager: Karen Ritchie Shihadeh
Commission Project Manager: Linda Spiegel
Commission Contract Manager: Sandra Barnett

The Issue

California's Central Valley contains approximately 6320 miles of transmission line, 952 of which are located in National Wildlife Refuges or state wildlife areas. Estimates of avian mortality from collisions with transmission lines in the United States (174 million annually) are rough and unsubstantiated due to a lack of information and reporting requirements. No estimates of mortality from collisions are associated with smaller distribution lines, which are far more numerous on the landscape. Some studies on larger-voltage transmission lines have demonstrated that marking conductors with bird flight diverters reduced incidence of avian collision. Power companies, in an effort to reduce avian fatalities and satisfy federal mandates, are interested in exploring and developing cost-effective, practical, and functional bird diverter technology.

The Merced National Wildlife Refuge

Project Description

The San Luis National Wildlife Refuge Complex (SLNWRC), located in California's Pacific Flyway, includes the San Luis, Merced, and San Joaquin River national wildlife refuges, and the Grasslands Wildlife Management Area. The SLNWRC is an important migration stopover and wintering site for cranes, waterfowl, geese, shorebirds, raptors, and passerines. Each winter it can host up to 20,000 California-threatened greater sandhill cranes *(Grus canadensis tabida);* over 850,000 ducks; and at least 70,000 geese including Aleutian Canada, Ross's, snow, and white-fronted geese. These avian guilds are considered high risk for power line collision, due to low wing loading, morphology, and flight and flocking behavior.

The SLNWRC experiences dense winter fog, which can severely reduce visibility and increase risk for bird collisions with the approximately 40 miles of low-lying 12 kilovolt distribution lines

in the area. In fact, there is documented history of collision-induced avian mortality and line outages.

The purpose of this research project is to assess bird response to two types of bird flight diverters at the San Luis National Wildlife Refuge Complex during periods of peak avian overwintering use and Central Valley fog. Researchers will document changes in bird flight behavior and bird carcass counts before and after installation of flight diverters. The research is being conducted by the Ventana Wildlife Society with in-kind support from Pacific Gas and Electric Company and U.S. Fish and Wildlife Services' San Luis National Wildlife Refuge Complex.

This research is consistent with the PIER's *Roadmap for PIER Research on Avian Collisions with Power Lines in California,*[1] which stated a research need to test and document diversion device efficacy under a variety of field conditions.

PIER Program Objectives and Anticipated Benefits for California

This project offers numerous benefits and meets the following PIER program objectives:

- **Providing environmentally sound and safe electricity.** This project aimed at evaluating available power line marking devices to deter birds from colliding with lines will generate information useful to utilities and wildlife refuge managers. Informative decision making will help reduce avian collisions with power lines in California.

- **Providing reliable electricity.** Reducing avian collisions with power lines will reduce collision-caused power outages.

- **Providing affordable energy services.** Understanding the efficacy of marking devices will reduce unnecessary costs associated with selecting untested, possibly ineffective, markers and the incidence of maintenance associated with birds striking wires.

Final Report

The final report on the results of this work will be available by December 30, 2007.

Contact

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[1] Hunting, Kevin. 2002. *A Roadmap for PIER Research on Avian Collisions with Power Lines in California.* California Energy Commission. Commission Staff Report. P500-02-071F. December 2002. www.energy.ca.gov/reports/2002-12-24_500-02-071F.PDF.